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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/636,042	08/07/2003	Steven A. Justiss	CROSS1560	9977

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EXAMINER

HEIN, GREGORY P

ART UNIT	PAPER NUMBER
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2188

DATE MAILED: 10/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/636,042		JUSTISS ET AL.	
	Examiner		Art Unit	
	Gregory P. Hein		2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 - 23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08/07/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>09/29/2005</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Status of Claims

Claims 1 – 23 are present for examination and claim 1 – 23 are rejected.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: ¶42 of the specification references Fig. 5 labels 61 – 63 and 65. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2188

1. Claims 1, 11 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the sequence of blocks of data" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "multiple write threads" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "identified portion of the blocks" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "the sequence of blocks of data" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites the limitation "multiple threads" in line 5. It is unclear if this limitation is equivalent to multiple threads in line 2.

Claim 16 recites the limitation "multiple threads" in line 10. It is unclear if this limitation is equivalent to "multiple threads" in lines 2 and 5.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2188

2. Claims 1 – 10 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pre-Grant Publication 2004/0243736 Hattrup et al. in further in view of U.S. Patent 6,892,199 Hong et al.

As per claim 1:

Hattrup discloses storage onto a sequential storage device by a third party device (Hattrup ¶73 lines 1 - 4) over a Storage Area Network (SAN) (Hattrup ¶72 lines 5 – 8).

While Hattrup acknowledges the potential to increase the number of source devices (Hattrup ¶63 lines 5 - 9), Hattrup does not explicitly teach a multi-threaded approach to data storage or creating a log to store stored data information.

Hong teaches sorting the data from a plurality of clients into a single data stream for storage (Hong Col. 8 lines 22 - 27) and creating an index of information equivalent to applicant's log on the storage device (Hong Col. 3 lines 15 - 21).

Hong and Hattrup are analogous art because both aim to improve storage backup methodologies. Hattrup acknowledges and discloses apparatus for multiple data sources. Hong discloses a method for efficient multi-threaded storage. Together they form a method for efficient multi-threaded storage onto a single sequential storage device and provide means for retrieval via an index. Hence, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Hong with Hattrup, for the advantages cited above.

Art Unit: 2188

As per claim 2:

Hattrup teaches inserting metadata into the data stream (Abstract). Hattrup also teaches metadata containing data offset information (Hattrup ¶87 lines 3 – 5).

Counting preceding data is inherent in this type of memory access for sequential storage devices due to the linear nature of accessing their memory locations.

As per claim 3:

Storing the data onto a storage device is only useful if the data is to be later recovered. It would be obvious to one of ordinary skill in the art that data retrieval is inherent in a data write since data is stored for later retrieval.

As per claim 4:

Hattrup teaches inserting metadata that precedes data (Hattrup Abstract). This metadata can include unique identifying information dependent on the data constituting a file mark including "... size information, error-checking information, a description for the data, a unique identifier for the data, a timestamp and the like" (Hattrup ¶59). Hattrup also teaches accessing data via memory offsets (Hattrup ¶15 lines 12 – 13). It is inherent in memory offset access that preceding data must be counted due to the linear nature of a sequential storage device.

As per claim 5, it is similar to claim 3 and rejected with the same rationale.

As per claim 6:

Hattrup teaches using a sequential storage device for the database storage medium (Hattrup ¶73 lines 1 - 4) and storing metadata onto the storage medium (Hattrup Abstract).

While the metadata is independent Hattrup does not disclose storing the metadata separately from the data.

Hong teaches storing an index onto the database wherein the data is stored. (Hong Col. 6 lines 44 – 49 and Col. 8 lines 22 - 27).

It would have been obvious to one of ordinary skill in the art to combine Hattrup and Hong for the reasons given in the rejection of claim 1.

As per claim 7:

Hattrup teaches loading autonomous instructions into a third party device for data backup onto a sequential storage device. As part of the instructions Hattrup discloses including the Logical Unit Number of the source (Hattrup ¶24 lines 12 - 16). Hattrup discloses allowing multiple sources (Hattrup ¶63 lines 5 - 9) and discloses the data manager connected to the source and destination via a SAN (Hattrup ¶70 lines 4 - 5).

Hattrup does not explicitly disclose storing the LUN of the data source, however, it would have been obvious to one of ordinary skill at the time of the invention to store the LUN source with the corresponding data log entry since including the LUN with the data log entry allows the data manager to properly restore data to its source storage device when multiple sources exist.

As per claim 8:

Hattrup does not teach identifying each thread by a corresponding device identifier.

Hong teaches associating the FIFO queues with a client (Hong Col. 6 lines 64 – Col. 7 line 1).

This requires associating a thread with a particular device thus giving each thread a device identifier. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine this feature of Hong with Hattrup, since associating the FIFO queues with a particular storage device allows for efficient multi-threaded storage.

As per claim 9:

Hong teaches storing an index onto the database wherein the data is stored.
(Hong Col. 6 lines 44 – 49).

As per claim 10:

Hong teaches a configuration module to provide the SMSM and the index builder with the directory path to the index (Hong Col. 3 lines 18 – 26). Providing a directory path to the index allows for storage on medium separate from the data backup device.

As per claim 23:

Claim 23 is functionally equivalent to claim 1 and hence is rejected with the same rationale. As per a software product, Hattrup teaches generating autonomous instructions (Abstract). These instructions must be stored onto a computer readable medium and must be executed by a third party requiring a data processor

3. Claims 11 – 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,892,199 Hong and further in view of U.S. Pre-Grant publication 2004/0243736 Hattrup.

As per claim 11:

Hong teaches merging data from several threads into a single data stream in a semi-sort merge fashion (Hong Col. 8 lines 22 – 27). Hong also teaches creating an index with information about the data stored onto the storage device (Hong Col. 6 lines 44 – 49).

Hong does not teach using a sequential storage device as the backup medium.

Hattrup uses a sequential storage device for the backup medium (Hattrup ¶72). Additionally, Hattrup acknowledges using multiple data sources though not specifically as in multiple threads (Hattrup ¶63 lines 5 – 9). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Hong and Hattrup since they both seek to improve storage backup techniques. Also, Hong provides a specific methodology to accomplish multi-threaded backup while Hattrup discloses the hardware means to accomplish this.

As per claim 12:

Hong discloses writing the index upon signaling of completion of a write command. (Hong Col 7 lines 8 - 10). Hong creates index entries corresponding to the write commands.

As per claim 13:

Hong teaches storing the index to a storage device wherein the data is located (Hong Col. 6 lines 44 – 49).

As per claim 14:

Art Unit: 2188

Hong teaches providing a configuration module to "...specify a directory path for the data files and the index fiels, and to provide the directory path to the SMSM and to the index builder..." (Hong Col. 3 lines 18 – 21).

As per claim 15:

Hattrup discloses using an offset (Hattrup ¶87 lines 4 - 5), starting at a location, to index to a particular location. Because of the purely linear access of sequential storage devices it is inherent that an index must be used to identify information and index to the corresponding location.

As per claim 16:

Hong teaches a semi-sort merge from a multi-threaded storage arrangement. A Semi-Merge Sort Module, a copy manager, manages the merge process. Hong also teaches a memory system, FIFO queues, having data to be stored onto the sequential storage device (Hong Col. 8 lines 22 - 27).

Hong does not teach a sequential storage backup device. Hong also does not teach a specific method of retrieval such as indexing to the storage device.

Hattrup teaches a sequential storage device used as the storage medium (Hattrup ¶99). Hattrup discloses including an offset with a marker as part of stored data identification. The copy manager taught by Hattrup (Hattrup ¶53) will count memory locations equal to the offset to arrive at the identified data (Hattrup ¶87). This involved indexing to a location corresponding to identified data and does not involve reading all the preceding data.

Both Hong and Hattrup aim to improve storage backup methodologies. Additionally, Hattrup's structural setup allows for multiple sources (Hattrup ¶63 lines 5 – 9). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Hong with Hattrup since both references teach more efficient storage backup. Hattrup acknowledges multiple data sources while Hong provides a specific method for handling a multi-threaded scenario.

As per claim 17:

Hong discloses FIFO queues coupled to the SMSM, which holds the burst data sent by the data sources. This data is then merged by the SMSM and stored in the storage device (Hong Col. 5 lines 50 - 64).

As per claim 18:

Hattrup discloses that the formatting for commands issued to the copy manager is in accordance with third party copy commands (Hattrup ¶29 lines 7 – 10).

As per claim 19:

Hong discloses a system with multiple clients (Hong Col. 9 lines 15 - 18). The clients disclosed are functionally equivalent to the hosts in claim 19.

As per claim 20:

Hattrup discloses a plurality of sources being connected as data sources (Hattrup ¶63 lines 5 – 9)

As per claim 21:

Hattrup discloses the data mover coupled to a SAN (Hattrup Fig. 1 and ¶8).

As per claim 22:

Art Unit: 2188

Hattrup discloses the data mover attached to a SAN, a variant of Network Attached Storage (Hattrup ¶72 lines 5 - 8).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory P. Hein whose telephone number is 571-272-4180. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregory Hein
09/29/2005

Mano Padmanabhan
10/14/05

**MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER**